

## **505 Precast/Prestressed Concrete Structures Quality Management Plan**

### **505.1 INTRODUCTION**

The Precast/Prestressed Concrete Structures Quality Management Plan (QMP) establishes the procedure for becoming a pre-qualified supplier of precast/prestressed concrete products (barrier, cattle guards, noise wall components, drainage boxes, bridge girders and other structural elements, circular pipe, pipe arch culverts, concrete box culverts, etc). The QMP assures that precast/prestressed concrete fabrication plants are capable of constructing quality concrete products. Only products produced by a pre-qualified supplier will be accepted and certified for UDOT use.

### **505.2 DEFINITIONS**

Precast concrete is any concrete product not cast in its final location regardless of the distance between the casting location and the point of installation or the size or complexity of the finished product.

UDOT certification of a supplier's plant comprises a review of the supplier fabrication methods, personnel training, and quality control systems.

UDOT pre-qualification of a supplier is separate from UDOT certification. It is required in order to provide products to a UDOT project. Pre-qualification requires UDOT certification and a legally binding written commitment to the quality principles and standards outlined in this document.

### **505.3 CATEGORIES OF PRECAST CONCRETE FABRICATORS**

Suppliers of precast concrete products are pre-qualified in two categories.

#### **Category One – Precast Concrete**

Products in this class are simple structures that generally stand alone. Examples include: drainage boxes, noise wall components, safety barrier, and pipe. This category also includes complex structural elements that are too large to ship due to load limits and are fabricated at a temporary project specific location. Category one suppliers are restricted to production in UDOT-certified plants that may be at established permanent or temporary project specific locations. Fabricators of precast concrete products, other than prestressed and concrete pipe manufacturers, must maintain certification through the Precast/Prestressed Concrete Institute (PCI) or the National Precast Concrete Association (NPCA).

Fabricators of concrete pipe and box culverts (and related precast products) must maintain certification through the NPCA or American Concrete Pipe Association (ACPA).

**Category Two – Prestressed / Post-Tensioned Concrete**

This category includes complex precast concrete structural elements requiring prestressing tendons, post-tensioning tendons, and all products produced by category one. Category two suppliers must produce from UDOT certified plants. These plants may be established permanent locations or temporary project specific locations. Fabricators of prestressed concrete products must maintain certification through the Precast/Prestressed Concrete Institute (PCI).

Temporary plants and permanent plants certification and pre-qualification may be revoked at anytime if requirements are not met.

Precast elements damaged during placement or assembly, even if repaired or otherwise accepted by the project, is grounds for revocation of certification and pre-qualification.

**505.4 PRE-QUALIFICATION OF PRECAST/PRESTRESSED CONCRETE SUPPLIERS**

Applicants shall submit to UDOT Central Materials, a letter requesting that it be designated as a pre-qualified supplier. The letter shall include the following:

- A. Proof the fabrication plant producing precast/prestressed concrete products is currently certified by UDOT Central Materials as outlined in this document.
- B. Name and phone number of the Quality Control (QC) Manager at each production location who may be contacted for scheduling of inspections and general information.
- C. The category or categories under which the supplier is seeking pre-qualification.
- D. State a commitment to the following:
  - 1. Meet or exceed UDOT's Standard Specifications, including all applicable ASTM and AASHTO specifications.
  - 2. Make available to UDOT Central Materials all records required by this document upon request.
  - 3. Maintain current certification through national professional associations. Attach documentation of certification.
  - 4. Submit to a minimum of one UDOT plant inspection per year in order to maintain certification.
- E. A statement verifying that the signer of the letter has the legal authority to bind the company.

UDOT Central Materials will make notification of acceptance as a Pre-Qualified Precast/Prestressed Concrete Supplier in writing.

## **505.5 SUPPLIER PLANT CERTIFICATION AND INSPECTION**

A pre-qualified supplier will adhere to the guidelines set forth in this document. Suppliers will pass a UDOT inspection prior to acceptance as a pre-qualified fabrication plant. UDOT will schedule an initial plant certification inspection visit at the request of the supplier. The request should be made at least six weeks prior to the planned start of production for a UDOT project to allow for inspector scheduling. The inspector will check the plant in accordance with the requirements of this document. Upon completion the inspector will submit a written report to the fabricator outlining all deficiencies observed. The supplier is required to address all deficiencies noted in the report before requesting another certification inspection. Upon completion of a deficiency-free inspection, UDOT Central Materials will issue a letter of certification.

Once certified, each plant will be subject to a minimum of one inspection per year. Suppliers may or may not be given advance notice of an inspection. Failure in one or more of the requirements may result in suspension of certification. Suspended suppliers may not provide products to UDOT projects during suspension and must address deficiencies within 30 days or certification will be revoked. Within the 30-day period the supplier must submit a letter to UDOT Central Materials outlining the corrective action taken for each violation. If the deficiencies are not addressed within 30 days the supplier's certification is revoked and they are removed from the pre-qualified list.

Suppliers suspended for a second time within a twelve-month period automatically have their UDOT certification revoked and are removed from pre-qualified status. Additionally, suppliers may have their certification revoked and be removed from pre-qualified status for any of the following:

- A. Loss of required professional certification.
- B. Loss of required certified staff.
- C. Gross negligence.

Disqualified suppliers have their UDOT certification revoked for at least one year. The supplier may apply for certification and reinstatement as a pre-qualified supplier no sooner than ten months after the revocation. At this time the supplier will be allowed to start the qualification process and work towards becoming a pre-qualified supplier of precast/prestressed concrete products. Revoked certification and disqualification of a supplier may be appealed to the UDOT Director for Construction and Materials. Upon review of the situation, the Director's decision is final.

### **505.5.1 Supplier QC Policies and Procedures**

Provide adequate training to familiarize all pertinent employees with the company's QC procedures. Have a written company QC policy statement, a copy of UDOT's "Steel and Concrete Construction Manual," and a QC manual that includes, at a minimum, the plant certification technical criteria set forth in this document. Each pertinent employee shall receive a copy of all three. Have a designated Quality Inspector (QI) present on every work shift. Quality Inspectors must be properly trained and thoroughly familiar with all required QC procedures. Additionally, QI's shall have the authority to fully enforce procedures.

The QI should report to an individual with the authority and knowledge to oversee plant operations.

### **505.5.2 Supplier Plant Requirements**

#### **505.5.2.1 QC Procedures**

Develop, periodically review and update as necessary, a company QC policy statement and manual. UDOT Central Materials must approve the QC Manual prior to acceptance as a pre-qualified supplier.

Designate a QI for every work shift. The QI must be UDOT TTQP CTT certified. Category two fabricators QI must be PCI Level I certified. The QI must be present during stressing operations, final rebar inspection, all concrete placements, and final inspection prior to shipment or placement.

QC Manager must be UDOT TTQP CTT and CsTT certified. Category two suppliers QC Manager must be PCI Level II certified.

Suppliers' batch plant or off-site ready-mix batch plants must be pre-qualified under UDOT's "Quality Management Plan: Ready-Mix Concrete".

Provide necessary training to designated QI and line personnel. QI shall have ready access to the latest company QC Manual.

Conduct meetings with the plant manager or designated representative and QC personnel a minimum of once every three months to review the plant's QC procedures, discuss possible changes and implement any procedural changes. The plant manager or designated representative shall review and evaluate the QC techniques of all QI once every six months to assure compliance with QA Section guidelines and certification procedures.

Submit to a minimum of one plant inspection, each year, by a QA Section Inspector.

Formally consider and address each deficiency noted in the QA Section inspection reports and conduct subsequent follow-up meetings to assure compliance.

#### **505.5.2.2 Required QC Records:**

Employee's current TTQP and PCI certifications (as appropriate), certification documents, and QC training records.

Written "new employee" training and/or orientation policy in the company files.

Copies of the plant's QC policy statement, QC manual, and UDOT's "Steel and Concrete Construction Manual."

Proof of current PCI, ACPA, or NPCA certification.

Complete QC inspection checklist, signed by the QI, for each work shift. Linear QC charts for air, slump, unit weight and concrete temperature for all units/lots produced for UDOT projects.

Minutes of meetings held between the plant manager and QC personnel.

Plant manager's evaluation of the QI performance of job duties.

Memorandum signed by the plant manager, detailing response and follow-up to each specified deficiency documented during a UDOT inspection.

#### **505.5.2.3 Calibration and Certification of Test Equipment.**

All testing equipment or devices used for measuring material quantities shall be in good repair, calibrated and certified as specified in AASHTO, ASTM, and the UDOT Standard Specifications.

Maintain certification of beams, scales, water meters and moisture probes at the batch plant as per UDOT Standard Specifications. If the supplier chooses to use an off-site Ready-Mix concrete supplier, the supplier must maintain a copy of the Ready-Mix company's batch plant certification records for beams, scales, water meters and moisture probes.

Maintain certification of air meters, unit weight buckets, slump cones, plastic concrete cylinder molds & rods, and thermometers.

Broken or malfunctioning equipment must be removed from service immediately and replaced with new or repaired/recalibrated equipment.

Use UDOT approved laboratories for concrete compressive strength tests which are used for prestressed girder release breaks or any informational concrete compressive

strength tests. A list of UDOT approved laboratories can be obtained through the UDOT Materials website (<http://www.udot.utah.gov/go/materials>)

#### **505.5.2.4 Required Test Equipment Records**

Notation on inspection checklist documenting which test equipment was used on each shift and corresponding certification dates.

Documentation proving the plant laboratory or the contract laboratory is UDOT qualified.

#### **505.5.2.5 Structural Construction Experience**

Category one fabricators of complex structural elements which are too large to ship due to load limits and are fabricated at a temporary project specific location are required to show documentation of a minimum of five years experience constructing highway bridges for state departments of transportation or other similar entities. List details of project completed within the last three years. Provide contact information for projects performed for owners other than UDOT.

The construction experience requirement is waived for pre-qualified category two suppliers.

### **505.6 UDOT NOTIFICATION OF START OF PRODUCTION**

In addition to the regular communication between the UDOT Resident Engineer and the general contractor, or between the general and sub-contractor, all suppliers shall notify UDOT Central Materials 14 days prior to project startup and then 24 hours prior to fabrication of any product to be used on UDOT specification controlled projects.

UDOT Central Materials  
Attn: Concrete Engineer  
4501 South 2700 West, Box 148410  
Salt Lake City, Utah 84114-8410

Phone: 1-801-965-3814  
Fax: 1-801-965-3843

## **APPENDIX A            UDOT INSPECTOR GUIDELINES**

### UDOT Inspector Check List:

1. Examine the plants QC Policy Statement and Manual.
2. Verify that the plant has a copy of UDOT's "Steel and Concrete Construction Manual" on file.
3. Review the distribution of QC Policy Statement and manual and its availability to employees.
4. Review QC training records.
5. Review the plant records to confirm that a QI has been assigned to each work shift and has signed the inspection checklist.
6. Interview the person(s) responsible for QC policies and procedures.
7. Verify the QI lines of authority.
8. Examine the plant's equipment certification records.
9. Review QC inspection checklist for compliance.
10. Review QC linear control charts for compliance.
11. Inspect testing equipment for damage and ensure all equipment is in good repair.
12. Verify UDOT qualification of plant or consultant laboratory.
13. Verify current ACPA, NPCA or PCI plant certification.
14. Verify concrete batch plant is pre-qualified under UDOT's "Quality Management Plan: Ready-Mix Concrete."